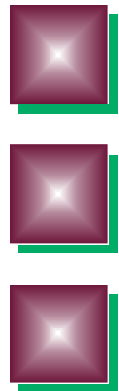


Background Data: Buchanan Field Airport

5



5

Background Data: Buchanan Field Airport

INTRODUCTION

This chapter documents the background data and assumptions on which the Buchanan Field Airport compatibility criteria set forth in Chapter 3 are based. A brief discussion, together with tabular data and maps, is included for each of the following topics:

- ' **Airport Features**
 - < Airport Features Summary (Exhibit 5A)
 - < Airport Layout Diagram (Exhibit 5B)
- ' **Airport Activity**
 - < Airport Activity Data (Exhibit 5C)
- ' **Noise Impacts**
 - < Current Noise Contours (Exhibits 5D, E, and F)
 - < Projected Noise Contours (Exhibits 5G, H, and I)
 - < Helicopter Flight Training Footprints (Exhibits 5J and K)
 - < Status of FAR Part 150 Noise Abatement Measures (Exhibit 5L)
 - < Noise Complaint Locations (Exhibit 5M)
- ' **Airport Environs**
 - < Airport Environs Summary (Exhibit 5N)
 - < General Plan Land Use Designations (Exhibit 5O)

AIRPORT FEATURES

Buchanan Field is the older of the two publicly owned airports in Contra Costa County. The airport dates from 1942 when the county acquired the property. The facility served as an Army air base during World War II, at which time the two original runways were constructed. Public use began in 1946 and has been continuous ever since.

Many modifications to individual components of the runway/taxiway system have been made over the years, but the basic configuration is essentially unchanged from when the airport opened. In particular, the airport's two major runways — now designated 1L-19R (oriented northeast/southwest) and 14L-32R (oriented northwest/southeast) — continue to have their original physical length despite several changes to landing threshold placement and usable length. Among the notable additions to the airfield was the construction during the 1960s of a shorter runway adjacent to each of the two primary runways. Also, from 1949 until 1967, a short, roughly east/west-oriented runway (now a taxiway) was in use.

Today, Buchanan Field Airport occupies a total of some 495 acres of property and controls aviation easements on an additional 50± acres. With extensive urban development on all sides, no significant changes in the airport's size or configuration are feasible. The most recent airport master plan, adopted in 1990, focuses primarily on building area improvements such as a potential terminal building and additional aircraft hangars. Future enhancements to instrument approach procedures are anticipated in the plan, but no physical extension of the runways or other major runway system changes are proposed.

A summary of current and planned features of Buchanan Field Airport is presented in Exhibit 5A. Exhibit 5B shows the existing airport layout and planned instrument approach procedure enhancements. The airport's Airspace Plan is included in Chapter 3 (Figure 3D).

GENERAL INFORMATION

- *Airport Ownership* — County of Contra Costa
- *Property Size*
 - Fee title: 495 acres
 - Avigation easements: 50± acres
- *Airport Classification* — Commercial Service (no scheduled airline service as of early 1999)
- *Airport Elevation* — 23 feet MSL
- *Access*
 - Adjacent to Interstate 680 and State Rte 4 freeways
 - South side access via Concord Avenue to John Glenn Drive
 - West side access via Marsh Drive to Sally Ride Drive

BUILDING AREA

- *Location* — South and west quadrants of airfield
- *Aircraft Parking Capacity*
 - Hangar spaces: 257±
 - Based aircraft tiedowns (FBOs and county): 386±
 - Transient aircraft spaces (county): 52
- *Services*
 - Aviation gasoline & jet fuel (after hours on request)
 - Major repairs, avionics
 - Airplane flight instruction, rental, charter, rides
 - Helicopter flight instruction, charter
- *Other Major Facilities*
 - FAA air traffic control tower
 - Hotel and restaurant

RUNWAY/TAXIWAY DESIGN**Runway 1L-19R**

- *Critical Aircraft* — Large business jet
- *Classification* — Airport Reference Code B-III (max. approach speed 121 kts; max. wingspan 118 ft.)
- *Dimensions*
 - 5,010 feet long, 150 feet wide
 - Rwy 19R threshold displaced 600 ft.
 - Rwy 1L usable takeoff length: 4,410 ft.
- *Pavement Strength*
 - 60,000 lbs single-wheel } aircraft main
 - 90,000 lbs dual-wheel } landing gear
 - 140,000 lbs dual-tandem-wheel } configuration
- *Average Gradient* — 0.04%
- *Runway Lighting* — High-intensity edge lights
- *Visual Navigational Aids*
 - Rwy 1L: REIL; VASI (4.0°)
 - Rwy 19R: MALS; VASI (4.0°)
- *Primary Taxiways* — Full-length parallels on west (Twy E) and east (Twy A) beyond Rwy 1R-19L

Runway 1R-19L

- *Critical Aircraft* — Small twin
- *Classification* — Airport Reference Code B-I (max. approach speed 121 knots; max. wingspan 49 ft.)
- *Dimensions* — 2,768 feet long, 75 feet wide
- *Pavement Strength*
 - 17,000 lbs single-wheel main landing gear
- *Average Gradient* — 0.07%
- *Runway Lighting* — Medium-intensity edge lights
- *Visual Navigational Aids* — None
- *Primary Taxiways* — Full-length parallel (Twy A) on east

Runway 14L-32R

- *Critical Aircraft* — Large business jet
- *Classification* — Airport Reference Code B-III (max. approach speed 121 knots; max. wingspan 118 ft.)
- *Dimensions*
 - 4,601 feet long, 150 feet wide
 - Rwy 14L threshold displaced 300 ft.
 - Rwy 32R threshold displaced 349 ft.
 - Rwy 14L usable takeoff length: 4,001 ft.
 - Rwy 32R usable takeoff length: 4,481 ft.
- *Pavement Strength*
 - 60,000 lbs single-wheel } aircraft main
 - 90,000 lbs dual-wheel } landing gear
 - 140,000 lbs dual-tandem-wheel } configuration
- *Average Gradient* — 0.15%
- *Runway Lighting* — Medium Intensity edge lights
- *Visual Navigational Aids*
 - Rwy 14L: None
 - Rwy 32R: REIL; VASI (4.0°)
- *Primary Taxiways* — Full-length parallel (Twy B) on west between runways

Runway 14R-32L

- *Critical Aircraft* — Small twin
- *Classification* — Airport Reference Code B-I (max. approach speed 121 knots; max. wingspan 49 ft.)
- *Dimensions* — 2,800 feet long, 75 feet wide
- *Pavement Strength*
 - 12,500 lbs single-wheel main landing gear
- *Average Gradient* — 0.18%
- *Runway Lighting* — None
- *Visual Navigational Aids* — None
- *Primary Taxiways* — Full length parallels on west (Twy J) and between runways on east (Twy B)

Exhibit 5A

Airport Features Summary

Buchanan Field Airport

APPROACH PROTECTION

- *Runway Protection Zones*
 - ▶ Runway 1L: 1,700 feet long; mostly on airport property or road and highway rights-of-way
 - ▶ Runway 19R: 2,500 feet long; approx. 90% on airport property, covered by aviation easements, or within creek channels or road rights-of-way
 - ▶ Runway 1R: 1,000 feet long; all on airport property
 - ▶ Runway 19L: 1,000 feet long; all on airport property or in creek channel
 - ▶ Runway 14L: 1,000 feet long; all on airport property, covered by aviation easements, or in road r.o.w.
 - ▶ Runway 32R: 1,700 feet long; 35% on airport or in creek channel; remainder private property
 - ▶ Runway 14R: 1,000 feet long; 80% on airport or in highway right-of-way; remainder private property
 - ▶ Runway 32L: 1,700 feet long; all on airport property
- *Approach Obstacles*
 - ▶ Runway 1L: Tree
 - ▶ Runway 19R: Trees, pole (threshold displaced)
 - ▶ Runway 1R: Trees
 - ▶ Runway 19L: Trees
 - ▶ Runway 14L: Road (threshold displaced)
 - ▶ Runway 32R: Fence, trees (threshold displaced)
 - ▶ Runway 14R: Road
 - ▶ Runway 32L: Light posts on east ramp area

AIRPORT PLANNING DOCUMENTS

- *FAR Part 150 Airport Noise Compatibility Program*
 - ▶ Completed March 1989
 - ▶ Approved with revisions by FAA, March 1991
- *Airport Master Plan*
 - ▶ Adopted by Board of Supervisors, September 1990
- *Airport Layout Plan*
 - ▶ Last updated February 1997

TRAFFIC PATTERNS AND APPROACH PROCEDURES

- *Airplane Traffic Pattern*
 - ▶ Runways 1L, 19L, 14L, 32L: Left traffic
 - ▶ Runways 1R, 19R, 14R, 32R: Right traffic
 - ▶ When tower closed: all runways closed except 1L-19R; left traffic to both ends
 - ▶ Pattern altitude: 1,000 feet AGL light airplanes; 1,500 feet AGL heavy airplanes
- *Instrument Approaches*
 - ▶ Runway 19R LDA (nonprecision)
 - straight-in (¾-mi. visibility, 360-ft. min. descent ht.)
 - course offset 7° right (west) of rwy alignment
 - circling (1-mi. visibility, 557-ft min. descent ht.)
 - ▶ Runway 19R VOR (nonprecision)
 - straight-in (¾-mi. visibility, 440-ft. min descent ht.)
 - course offset 17° right (west) of rwy alignment
 - circling (1-mi. visibility, 617-ft min. descent ht.)
 - ▶ Runway 19R NDB or GPS (nonprecision)
 - straight-in (1¼-mi. vis., 1,020-ft. min. descent ht.)
 - circling (1-mi. visibility, 1,017-ft min. descent ht.)
 - ▶ All Procedures
 - missed approach turns east, then north
 - no circling west of Runway 1L-19R
- *Operational Restrictions*
 - ▶ Only Rwy 1L-19R open after tower closes at night
 - ▶ Rwy 19R left traffic when tower closed
 - ▶ No training operations 10 p.m. to 7 a.m. weekdays, 10 p.m. to 8 a.m. weekends and holidays
 - ▶ Rwy 32L & 19L preferred for touch-and-goes
 - ▶ Intersection departures prohibited on Rwy 19R/L and 14R/L
 - ▶ Noise abatement flight routes defined
 - ▶ Noise restrictions based upon FAR Part 36 takeoff criteria: airplanes exceeding 78 dBA prohibited at all times; above 75 dBA prohibited 10 p.m. to 7 a.m.
- *Helicopter Traffic Pattern* — Two closed-circuit training patterns established by informal agreement

PROPOSED FACILITY IMPROVEMENTS

- *Airfield and Building Area*
 - ▶ Establish precision instrument approach procedure on Runway 19R and nonprecision procedures for Runways 1L and 32R
 - ▶ Construct new parallel taxiway west of Rwy 1L-19R
 - ▶ Establish terminal area & construct terminal building in west quadrant
 - ▶ Construct additional hangars (corporate, executive, & T-hangars) in west quadrant as needed
 - ▶ Construct based aircraft apron in north quadrant as needed
- *Approach Protection*
 - ▶ No future RPZ property acquisition planned

Source: Data Compiled by Shutt Moen Associates (April 2000)

Exhibit 5A, continued

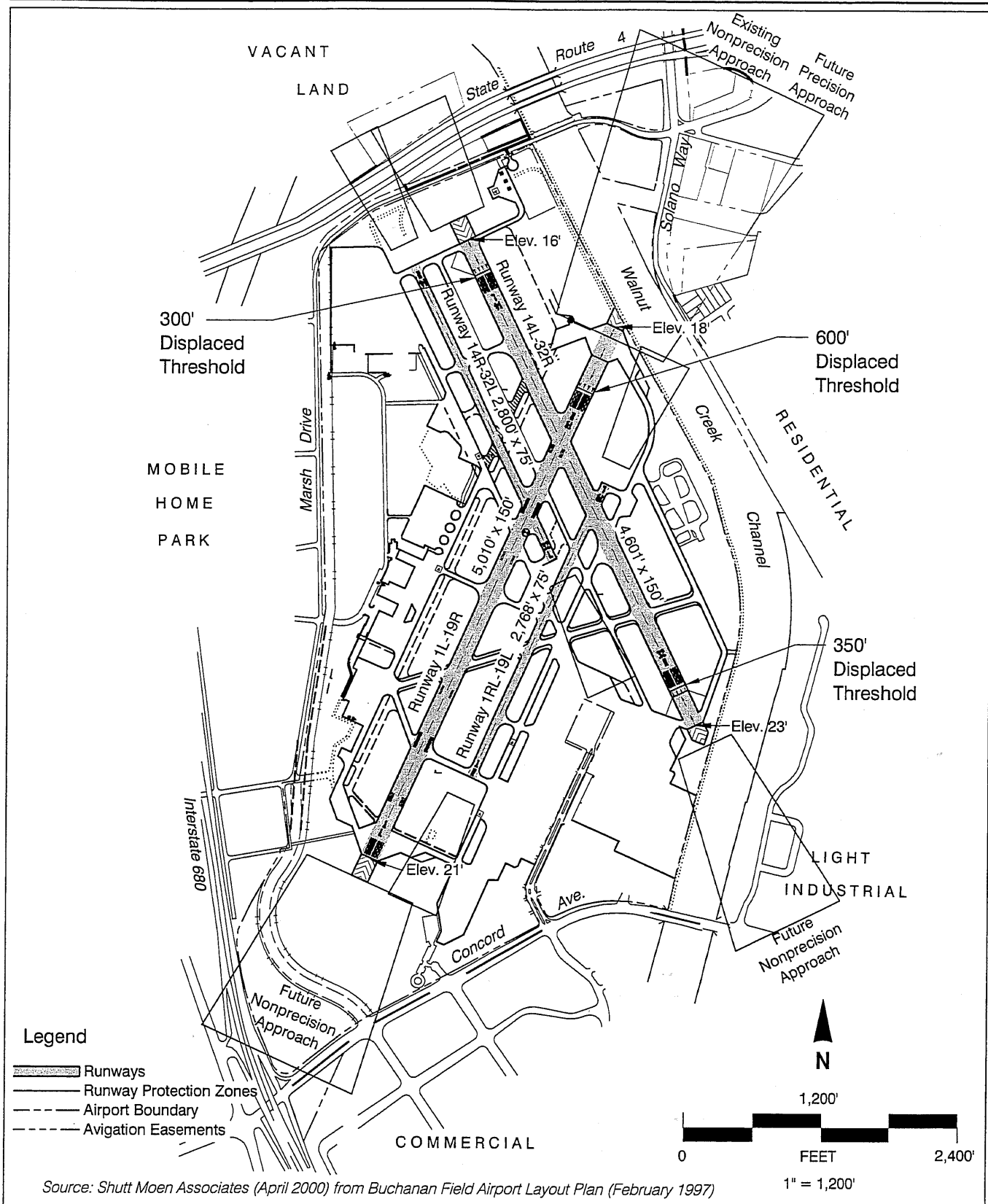


Exhibit 5B

Airport Layout Diagram Buchanan Field Airport

AIRPORT ACTIVITY

Except for its military beginnings, the primary role of Buchanan Field has always been and is expected to remain as a general aviation airport serving Contra Costa County and portions of adjacent counties. The airport has briefly had scheduled airline service in the past and there are prospects for such service again in the future, but this role is limited by constraints of the airport's facilities and environs.

Exhibit 5C contains a summary of current (1999/2000) Buchanan Field Airport activity. Approximately 235,000 aircraft operations took place during 1999, including takeoffs and landings during nighttime hours after the traffic control tower is closed. Despite year-to-year fluctuations, this total remained relatively constant throughout the 1990s, but well below the 1978 historical high of over 350,000 operations. Helicopter operations — primarily flight training — account for some 35% of current activity. Buchanan Field Airport had no scheduled airline service during 1999.

Also included in Exhibit 5C are projections of future activity under three different sets of assumptions regarding airline and helicopter operations. Scenario A assumes that the airport will continue without scheduled airline service and that extensive helicopter flight training will cease. Scenario B is a continuation of current conditions — helicopter flight training, but no airline service. Scenario C assumes that helicopter flight training will remain at its current level and that limited airline service will commence. The airline service projection is set at 20,000 aircraft operations annually or an average of about 27 flights per day. All of the airline aircraft operations are assumed to be by regional-jet type aircraft (50 to 75 passenger aircraft weighing less than 75,000 pounds gross) comparable to recent model, large business jets.

For other types of aircraft, the current activity volume is projected to increase by approximately 37%. All three future scenarios assume the same percentage growth. This increase is consistent with the projected growth in based aircraft to a total of 850 which represents the build-out capacity indicated on the current airport layout plan. Total aircraft activity — with helicopter flight training and schedule airline operations included — is expected to reach no more than 320,000 operations, still below the airport's historic high.

In all of these scenarios, the forecasts are for an undefined future year. For land use compatibility planning purposes, the specific year in which the projected activity levels are reached is not particularly significant. More important is to plan for a volume of activity that can reasonably be anticipated at some time in the future, regardless of when.

BASED AIRCRAFT

<i>Aircraft Type</i>	Current ^a (2000)	Future ^b Scenario A	Future ^b Scenario B	Future ^b Scenario C
Piston, Single-Engine	501	715	715	715
Piston, Multi-Engine	30	45	45	45
Turboprop	16	30	30	30
Business Jet	17	25	25	25
Helicopters	28	5	35	35
Total	592	820	850	850

AIRCRAFT OPERATIONS

	Current ^c (1999)	Future ^d Scenario A	Future ^d Scenario B	Future ^d Scenario C
<i>Total</i>				
Annual	237,000	214,000	300,000	320,000
Average Day	644	586	822	877
<i>Annual Operations by Aircraft Type</i>				
Piston, Single-Engine				
Fixed Pitch Prop	92,000	119,000	119,000	119,000
Variable Pitch Prop	26,000	37,000	37,000	37,000
Piston, Multi-Engine	23,500	32,000	32,000	32,000
Turboprop	6,100	11,000	11,000	11,000
Business Jet				
Turbofan, Small	2,100	4,800	4,800	4,800
Turbofan, Medium & Large	2,700	6,200	6,200	6,200
Turbojet (old models)	600	0	0	0
Airline (regional jets)	0	0	0	20,000
Helicopter	84,000	4,000	90,000	90,000
<i>Touch-and-Go Percentage by Aircraft Type</i>				
Piston, Single-Engine				
Fixed Pitch Prop	65%	60%	60%	60%
Variable Pitch Prop	25%	25%	25%	25%
Piston, Multi-Engine	15%	15%	15%	15%
Helicopter	50%	10%	45%	45%

TIME OF DAY DISTRIBUTION ^e

	Day (7 a.m. to 7 p.m.)	Evening (7 p.m. to 10 p.m.)	Night (10 p.m. to 7 a.m.)
Current and Future			
<i>Takeoffs</i>			
Piston, Single- & Twin-Engine	90%	8%	2%
Turboprop & Business Jet	85%	12%	3%
Helicopters	94%	5%	1%
Airline (future only)	80%	20%	0%
<i>Landings</i>			
Piston, Single- & Twin-Engine	90%	8%	2%
Turboprop & Business Jet	85%	12%	3%
Helicopters	89%	10%	1%
Airline (future only)	70%	30%	0%
<i>Touch-and-Goes</i>			
Piston, Single- & Twin-Engine	97%	3%	0%
Helicopters	97%	3%	0%

Exhibit 5C

Airport Activity Data

Buchanan Field

RUNWAY USE DISTRIBUTION ^a	Takeoffs	Landings	Touch-and-Goes
Day and Evening — Current			
<i>Piston, Single- & Twin-Engine</i>			
Runway 1L	7.0%	7.0%	4.0%
Runway 19R	28.0%	30.0%	16.0%
Runway 1R	3.0%	3.0%	6.0%
Runway 19L	16.0%	14.0%	18.0%
Runway 14L	0.6%	0.6%	0.4%
Runway 32R	25.0%	25.0%	17.0%
Runway 14R	0.4%	0.4%	0.6%
Runway 32L	20.0%	20.0%	28.0%
<i>Turboprop & Business Jet</i>			
Runway 1L	10.0%	9.0%	
Runway 19R	44.0%	47.0%	
Runway 14L	1.0%	1.0%	
Runway 32R	45.0%	43.0%	
<i>Helicopter</i>			
Runway 1 direction	10.0%	10.0%	10.0%
Runway 19 direction	44.0%	44.0%	44.0%
Runway 14 direction	1.0%	1.0%	1.0%
Runway 32 direction	45.0%	45.0%	45.0%
Day and Evening — Future			
<i>Piston, Single- & Twin-Engine</i>			
Runway 1L	7.0%	6.5%	4.0%
Runway 19R	28.0%	31.0%	16.0%
Runway 1R	3.0%	2.5%	6.0%
Runway 19L	16.0%	13.0%	18.0%
Runway 14L	0.6%	0.6%	0.4%
Runway 32R	25.0%	27.0%	17.0%
Runway 14R	0.4%	0.4%	0.6%
Runway 32L	20.0%	19.0%	28.0%
<i>Turboprop & Business Jet</i>			
Runway 1L	10.0%	8.0%	
Runway 19R	44.0%	45.0%	
Runway 14L	1.0%	1.0%	
Runway 32R	45.0%	46.0%	
<i>Airline</i>			
Runway 1L	10.0%	8.0%	
Runway 19R	44.0%	47.0%	
Runway 14L	1.0%	1.0%	
Runway 32R	45.0%	44.0%	
<i>Helicopter</i>			
Same as Current Distribution			
Night — Current and Future			
<i>Piston, Single- & Twin-Engine</i>			
Runway 1L	48.0%	48.0%	
Runway 19R	52.0%	52.0%	
<i>Turboprop & Business Jet</i>			
Runway 1L	90%	90%	
Runway 19R	10%	10%	
Notes			
^a Source: Airport management data as of March 2000			
^b Source: Shutt Moen Associates projections based upon aircraft parking capacity shown on <i>Airport Layout Plan</i>			
^c Source: Shutt Moen Associates and airport management estimates based upon FAA control tower air traffic counts			
^d Source: Shutt Moen Associates projections			
^e Source: Shutt Moen Associates and airport management estimates			
Source: Data compiled by Shutt Moen Associates (April 2000)			

Exhibit 5C, continued

NOISE IMPACTS

Cumulative Noise Impacts

Noise impact contours associated with current and future Buchanan Field Airport aircraft activity are illustrated on the following pages. These contours were calculated using the FAA's Integrated Noise Model and the activity data listed in Exhibit 5C.

The contours depicted in the Exhibits 5D through 5I represent cumulative noise impacts measured in terms of Community Noise Equivalent Level (CNEL). For both the current and future time frames, the input assumptions were varied to assess the effect on the resulting contours. The specific conditions shown are as follows:

- **Current (1999) Noise Impacts**
 - < *Exhibit 5D*: Total aircraft operations (237,000).
 - < *Exhibit 5E*: Current activity, but with helicopter flight training operations excluded.
 - < *Exhibit 5F*: Current activity including helicopter flight training, but excluding 1970s era business jets.
- **Projected Noise Impacts**
 - < *Exhibit 5G*: Future activity without helicopter flight training (Scenario A).
 - < *Exhibit 5H*: Future activity with helicopter flight training (Scenario B).
 - < *Exhibit 5I*: Future activity with helicopter flight training and limited scheduled airline service using regional jets (Scenario C).

A comparison among all of these contour sets shows relatively little significant differences. Because noise is measured on a logarithmic scale and CNEL is a cumulative calculation, noise contour size is usually controlled more by a small volume of relatively loud aircraft than by a large volume of comparatively quiet aircraft. Thus, the projected increase in total aircraft operations is balanced in terms of contour size by the anticipated elimination over time of the older, louder, business jet aircraft. Even the potential introduction of scheduled airline service using current technology aircraft would have minimal effect on the noise contours. The noise levels generated by these aircraft is similar to that of average business jets now operating at the airport. Appendix C2 depicts the relative loudness of selected aircraft which commonly operate at Buchanan Field Airport.

Helicopter Noise

One final set of noise contours is provided here in response to community comments regarding the impacts of helicopter flight training noise. As a comparison between Exhibit 5D and 5E or between Exhibit 5G and 5H shows, helicopters make only a small contribution to the airport's cumulative noise contours despite representing a third of the current total operations. This occurs because the takeoff

and landing noise footprint of helicopters is very small, as Appendix C2 illustrates. Nevertheless, helicopter noise is particularly annoying to many people. The staccato nature of the sound is one factor, but, for the Buchanan Field environs, the frequency of the flights is probably more significant.

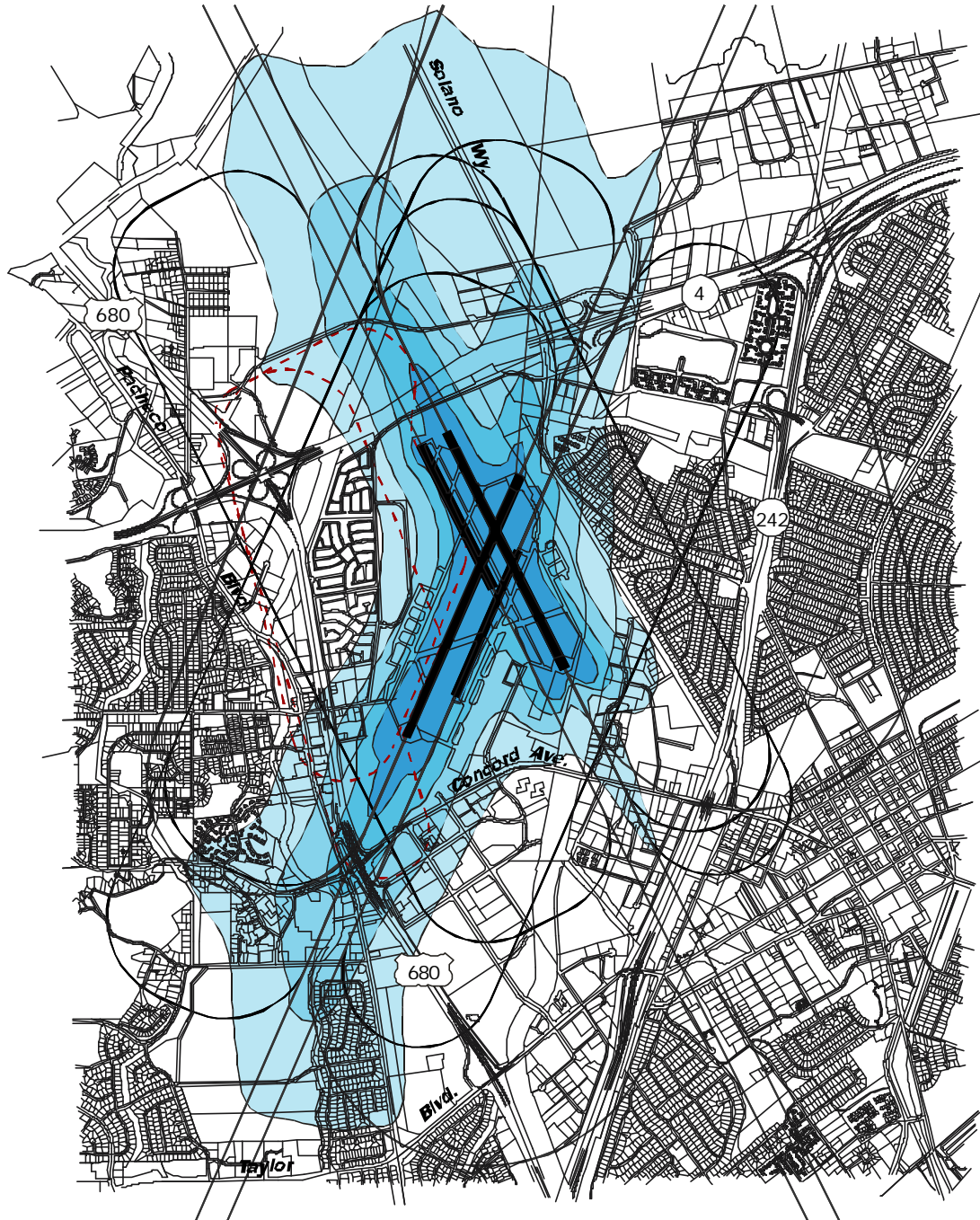
Exhibits 5J and 5K show the effect of extending the single-event helicopter noise footprint to follow a closed-circuit, flight training pattern. The two traffic patterns depicted are ones most commonly flown, but all helicopters do not necessarily follow these exact lines. The contours indicate areas where noise-sensitive outdoor activities could be briefly interrupted as a helicopter flies past. Coupled with the fact that these patterns are flown by some 40,000 helicopters per year (some 200 flights per day, 5 days per week except for holidays and bad weather), the reason for some people to be annoyed becomes apparent.

Status of FAR Part 150 Noise Reduction Measures

In 1989, Contra Costa County prepared a *Noise Compatibility Program* for Buchanan Field Airport in accordance with the methodology specified in Part 150 of the Federal Aviation Regulations. This study identified a series of actions designed to reduce airport-related noise impacts on the surrounding communities. Most of these noise reduction measures are now in effect. Exhibit 5L lists the individual measures and summarizes the status of each.

Noise Complaints

Since 1989, Buchanan Field Airport management has maintained a log of phone calls received from airport area residents complaining about aircraft noise. Exhibit 5M summarizes the geographic distribution of this data. Each dot represents the approximate location from which a complaint call has been received on one or more occasions during the 1989 to 1999 time period. Many individuals have called multiple times.



Activity Assumptions

- 230,000 Total Annual Aircraft Operations
- 82,000 Helicopter Operations Included
- 6001970s Era Business Jets Included

- - - Typical Helicopter Touch & Go Flight Tracks
- Typical Airplane Flight Tracks
- 55-60dBCNEL
- 60-65dBCNEL
- 65-70dBCNEL
- 70+dBCNEL

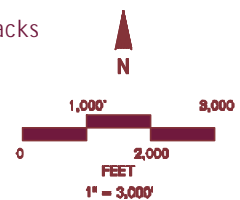


Exhibit 5D

**Current Noise Contours
Total Activity
Buchanan Field Airport**



Exhibit 5 E

Current Noise C ontours without Helicopter Flight Training BuchananField Airport

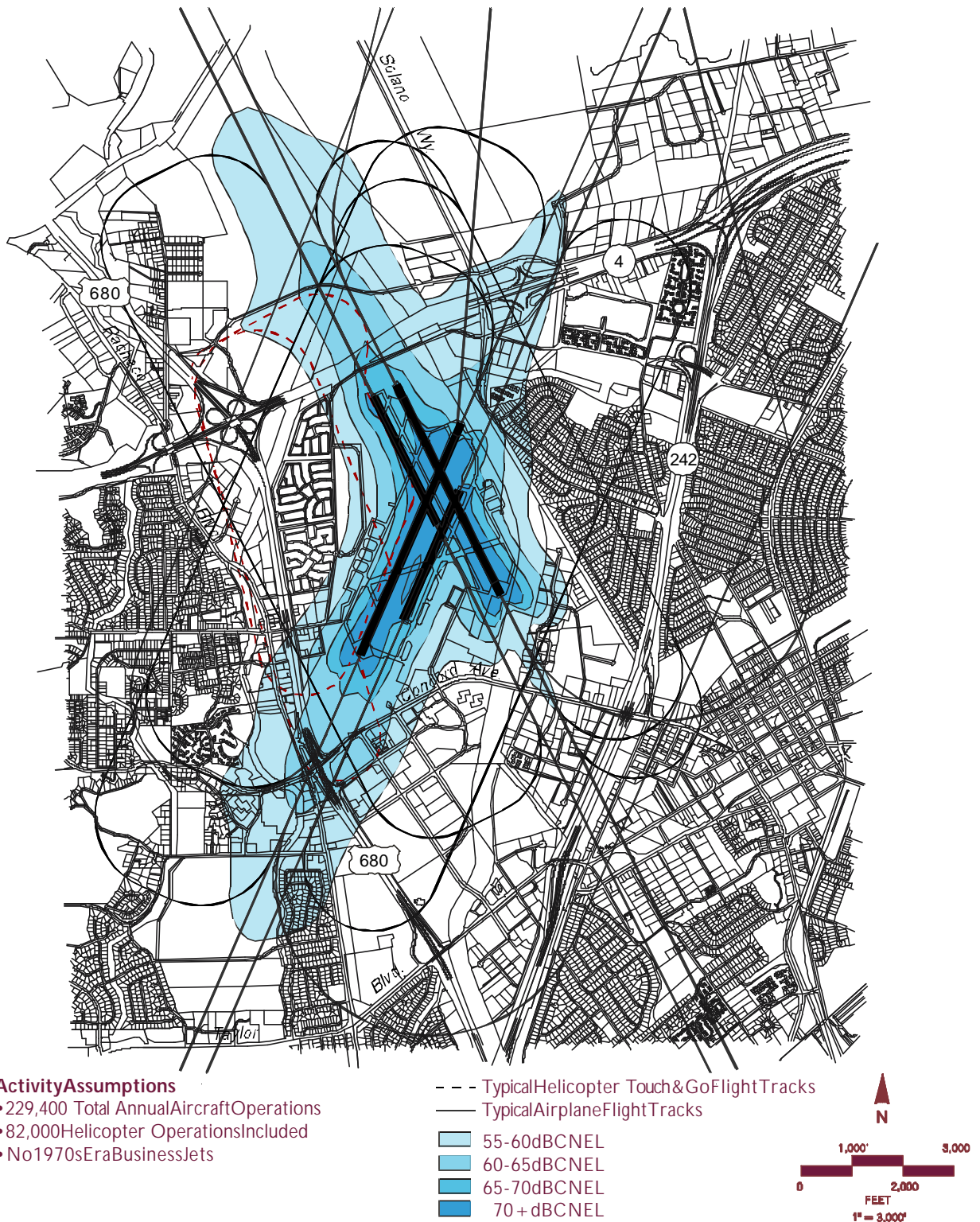
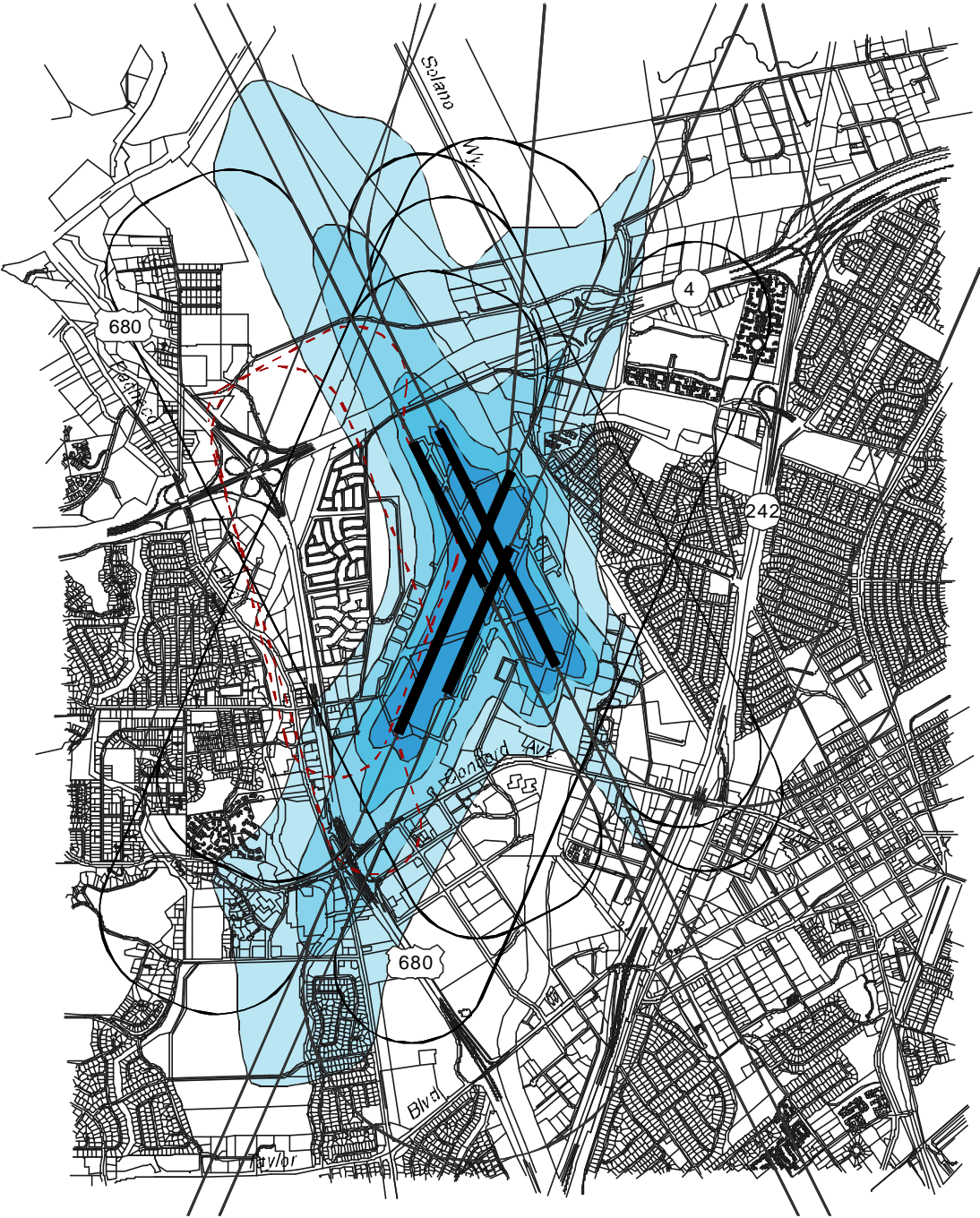


Exhibit 5F

Current Noise Contours without Old Jets Buchanan Field Airport



Activity Assumptions

- 214,000 Total Annual Aircraft Operations
- 4,000 Helicopter Operations Included
- No 1970s Era Business Jets

- - - Typical Helicopter Touch & Go Flight Tracks
- Typical Airplane Flight Tracks
- 55-60 dBCNEL
- 60-65 dBCNEL
- 65-70 dBCNEL
- 70+ dBCNEL

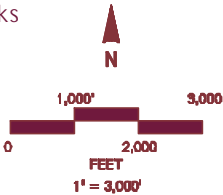


Exhibit 5G

**Projected Noise Contours
without Helicopter Flight Training
Buchanan Field Airport**